

**SECTION 27 4116.51**  
**AUDIOVISUAL POLE VAULT SYSTEMS FOR**  
**CLASSROOM, LIBRARY AND CONFERENCE ROOMS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Section Includes
  - 1. Requirements for an Integrator to provide equipment for and install a complete instructional classroom that can be arranged in multiple configurations. There will be a multimedia display as primary projection. Flexibility and integration of multiple technologies and sources, and multiple user groupings are essential to this concept. As an example, all audio and image sources should be capable of being shown on the screen and heard in the room.
  - 2. The work covered in this document consists of furnishing all labor, material and services necessary to install a complete audiovisual system as indicated on the project drawings and in these specifications.
  - 3. Related Sections
- B. Division 1
- C. Section 11 52 16: Projectors
- D. Section 26 05 00: Common Work Results for Electrical
- E. Section 27 10 00: Structured Cabling
- F. Section 27 30 00: Voice Communications
- G. Section 27 41 33: Master Antenna & TV Systems
- H. Section 27 50 00: Digital Intercom/Clock & Bell

**1.02 REFERENCES**

- A. National Electrical Manufacturer's Association (NEMA)
- B. American National Standards Institute (ANSI)
- C. National Electric Code (NEC)
- D. Relevant State Electric and Fire Codes
- E. Institute of Electrical and Electronic Engineers (IEEE)
- F. Underwriters Laboratories, Inc. (UL)
- G. ANSI/EIA/TIA 568A-1995 Commercial Building Telecommunications Wiring Standard
- H. ANSI/EIA/TIA 568-B.2-1 Transmission Performance Category 6 Cabling Specifications for 4-Pair 100 Ohm.
- I. ANSI/EIA/TIA 569A Commercial Building Standard for Telecommunications Pathways and Spaces
- J. ANSI/EIA/TIA 606 the Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
- K. ANSI/EIA/TIA 607 Commercial Building Grounding and Bonding Requirements for Telecommunications
- L. EIA/TIA TSB 67 Transmission Performance Specifications for Field Testing of Unshielded Twisted-Pair Cabling System
- M. Building Industry Consulting Service International (BICSI) publications:
  - 1. Telecommunications Distribution Methods Manual
  - 2. Telecommunications Cabling Installation Manual
- N. Manufacturer's recommendations and installation guidelines

- O. All cabling shall comply with all appropriate requirements of NEC Articles 770 and 800 and shall comply with the State Fire Codes as interpreted by the State Fire Marshall's Dept.
- P. All publications referred to in this document shall be the latest edition thereof together with any amendments and/or addenda current ten days before the date fixed for return of bids.

### **1.03 SUBMITTALS**

- A. Certificates
  - 1. Contractor shall hold and maintain manufacturer's certification for the Audiovisual system.
  - 2. The contractor must be certified with the manufacturer for the Audiovisual system for at least twelve (12) months prior to bid.
  - 3. The Contractor shall provide proof of certification to the District.
- B. Qualification Statements
  - 1. Provide Contractor's experience and qualifications, which shall include three (3) years of projects of similar complexity. Include names and locations of two projects successfully completed using an instructional classroom technology.
  - 2. Provide documentation indicating Contractor has been in the telecommunication contracting business for a minimum of five (5) years under the same name and are located within a two hundred (200) miles of the District.
- C. Refer to Section 01 33 00 for additional requirements.

### **1.04 CLOSEOUT SUBMITTALS**

- A. Documentation to be submitted upon completion of system are:
  - 1. Upon completion of installation, the contractor shall prepare "as built" drawings of the system. As built shall be 30" by 42" format Mylar reproducible drawings of each floor plan indicating exact device locations, panels, cable routes and wire numbers as tagged.
  - 2. Maintenance required and maintenance schedule.
  - 3. Provide a list of MLC devices, IP address, MAC address and location.
- B. Refer to Section 01 77 00 for additional requirements.

### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
- B. Repair or replace damaged components before Substantial Completion of the project.

### **1.06 WARRANTY**

- A. The Contractor shall provide manufacturer's warranty that any equipment installed under this specification shall be free from defect for a period of five (5) years from the date of final acceptance.
- B. The Contractor shall warrant the workmanship and installation of the system for two (2) years.
- C. During the warranty period, the Contractor shall provide the District with the manufacturer toll-free hotline and support center to assist the District to service the specified product.
- D. During the warranty period, the Contractor shall maintain adequate stock of potential replacement parts to service the system should component failure occur.

## **PART 2 - PRODUCTS**

### **2.01 ACCEPTABLE MANUFACTURERS – SYSTEMS**

- A. Audiovisual Equipment
  - 1. RGB Systems, Inc. dba Extron Electronics, No substitutions are permitted – District Standard.
- B. Projector
  - 1. Casio <<http://www.casio.com/products/Projectors/>>
  - 2. Or approved equal.
- C. Projector Security Locking Device

1. Business Machine Security, <<http://www.locdown.com/>>
  2. Or approved equal.
- D. TV Tuner Media Box
1. AverMedia USA, <<http://www.avermedia-usa.com/AVerTV/>>
  2. Or approved equal.
- E. All equipment part numbers shall be listed in the bill of materials and the system drawings specifications.

## **2.02 SYSTEMS DESCRIPTION**

- A. Provide a complete Audiovisual System in locations indicated on the Drawings.
- B. The system switching and audio amplification equipment shall be securely mounted and concealed in an enclosure above the ceiling mounted projector.
- C. Audio and image source equipment shall be connected to the system and displayed via four, active (powered) interface panels located throughout the room. The audio and image signals from source devices shall be transmitted from the active interface panels over standard UTP cabling architecture.
- D. Classroom Definition: A classroom that has fixed instructional media video projection capabilities, Internet connectivity at the teacher's desk, student networking (usually wireless), a document camera (not in contract "NIC"), VCR/DVD (NIC), and other multimedia input devices, standard laptop interface, multimedia control system that is connected to the network and capabilities for additional add-on modular features.
- E. The room shall include control systems that have American Disabilities Act, Section 508 compliant buttons that are discernible without activating the controls or buttons on the control panel, closed captioning, and hearing assistance capability.

## **2.03 GENERAL EQUIPMENT REQUIREMENTS**

- A. The room will be equipped with a standard easy to operate interface (a tactile button keypad layout). The audio system may be monaural or stereo for program sound. The classroom AV system will be controlled by a control system with a control panel mounted near the teacher's desk, refer to the drawings for exact location. System parameters can be monitored, administered and controlled over the data network. The instructional media equipment will be located within close proximity to the teacher's desk or through a Graphical User Interface (GUI) on a computer (NIC) to allow for ease of operation during instruction.
- B. Acceptable functionality requirements are listed below categorized by type of equipment. Quantities are listed for movable, portable or loose equipment, and other selected entries. Where quantities are not listed, refer to the system drawings.
- C. All products shall be new and under warranty at the time of installation. B-stock, previously installed, refurbished or used equipment shall not be provided on this project.
- D. The Integrator shall provide all options, accessories and hardware necessary to meet the function of the design even if they are not specifically listed (i.e. mounting kits, separate or additional power supplies, input modules, transformers, etc.).

## **2.04 FIXED EQUIPMENT**

- A. Audiovisual Extron System
  1. Provide E-Rate Eligible System Extron Model PVS 300IP Plus, Three Input Pole Vault IP Plus System, part number 80-300-13:
    - a. Mounting - The audio, video, data connectivity components and projector shall be mounted using the following components.
      - 1) Ceiling projector mounting
        - (a) Projector Drop Ceiling Mount with adjustable pole - PCM340
          - (1) The projector drop ceiling mount must be capable of mounting to the structural ceiling (concrete or wood joists), above the suspended T-Bar ceiling via turnbuckles and tie wire or threaded rod, per manufacturer's instructions

- (2) The mount shall be capable of supporting up to 50 pounds (23 kgs) of A/V equipment.
    - (3) The mount must also include (1) single gang and (1) double gang knockout openings for junction boxes or for use as cable pass-through.
    - (4) Projector drop mount (footage from screen) distance to projector screen must be confirmed prior to installation by District representative.
  - 2) Hard lid ceiling projector mount optional mounting hardware
    - (a) ACMP 100 Angled ceiling mounting plate
    - (b) FCMP 44 Flat ceiling mounting plate
  - b. Projector Mounting Pole
    - 1) The projector mounting pole shall be 1.5" NTP (National Tapered Pipe) threaded pipe threaded at one end to facilitate mounting the projector to the universal projector mount.
    - 2) The projector mounting pole shall be adjustable for various lengths beginning at 1.5" up to 23.5" to accommodate various ceiling heights.
    - 3) The pole shall provide a slot throughout the length of the pole to allow for easy cable access.
  - c. Multi-Product Mounting Kit –PMK340
    - 1) The multi-product mounting kit houses the key electronic components of the A/V system including the switcher, audio amplifier and power supply. The kit shall support mounting in close proximity to the display device, and protect the contained components from tampering and theft.
- 2. Media Source Switching
  - a. System source selection and switching shall be provided by a PVS A/V Switcher – PVS305SA IP
  - b. The switcher shall have two (2) RGB video inputs capable of VGA - UXGA RGBHV, RGBS, RBsB and RsGsBs input resolution via (2) two pairs of female RJ-45 connectors
  - c. The switcher shall have two (2) inputs that can be configurable for either composite video via two (2) female RJ-45 connectors or two (2) additional RGB video inputs capable of VGA - UXGA RGBHV, RGBS, RBsB and RsGsBs input resolution via (2) two pairs of female RJ-45 connectors.
  - d. Audio input for switched video sources shall be via four (4) stereo, balanced/unbalanced inputs via the same four and/or six (4 and/or 6) RJ-45 RGB and Composite video connectors.
  - e. The switcher shall have a switched auxiliary audio input to support audio from video sources that are directly connected to the projector or sources that only offer audio content.
  - f. The switcher shall have two video outputs, one (1) RGB output capable of outputting VGA - UXGA RGBHV, RGBS, RBsB and RsGsBs (following input type) via a 15-pin HD female connector and one (1) composite video via one (1) RCA female connector.
  - g. Connection from the switcher to the display device shall be provided with one 3' VGA to VGA and one 3' composite video cable.
  - h. An onboard audio amplifier shall provide gain / volume adjustment from -10db to +10db, adjustable in 1 db steps. The speaker amplifier shall have two (2) channels, one (1) stereo (default) or dual (2) mono channels via one (1) 5.0 mm 4 pole captive screw connector. The output of the amplifier shall be 25 watts (rms) per channel at 2/4/8 ohms.
  - i. In addition to the stereo / mono speaker output, an additional audio output that will produce line level output shall also be available. This line level audio output must be capable for being set at either "fixed" or "variable" and with Balanced or Unbalanced settings.
- 3. Data Connectivity

- a. The audio video system shall incorporate features that expand access and connectivity to an existing data network.
- b. The PVS Switcher shall incorporate a four port network switch, allowing a single network drop to provide connectivity for two computers (NIC) and the MLC controller in each room.
- c. The audio video system shall include a dual network pass through wall plate and cabling for easily connecting room based computer devices to the network switch in the PVS Switcher.
- d. The audio video system shall include a IP Link enabled MediaLink controller, also connected to the network switch in the PVS Switcher, allowing remote monitoring, scheduling and control of the system over a network.
4. Media Source Control
  - a. Classroom media sources shall be controlled with a MediaLink Controller - MLC 104IP Plus
    - 1) The MediaLink Controller shall contain six tri-color, multi-status LED push-buttons for device selection and projector on / off control. A rotary volume control knob with five (5) LED volume indicators shall permit system volume level control.
    - 2) The MLC Controller shall feature Extron IP Link Ethernet for monitoring, scheduling and control. This IP technology shall enable the device to be controlled, scheduled and monitored over a LAN, WAN or the Internet using Extron Global Viewer or MLC controller software.
    - 3) The Controller shall contain a serial host port which shall consist of one (1) bi-directional RS-232 front panel 2.5mm mini stereo jack. This host connection port shall be for configuration and control of the controller itself and to install device drivers for the equipment to be controlled.
    - 4) The Controller shall also feature (2) bi-directional serial ports to provide device control. These two ports shall control the display device and PVS Switcher respectively via bi-directional RS-232 control via one (1) 3.5mm direct insertion captive screw connector.
    - 5) The MLC Controller shall also have two (2) configurable (via software) digital input / outputs for devices such as sensors, switches, LEDs and relays via one (1) 3.5mm 4-pole direct insertion captive screw connector.
    - 6) Connection from the MLC Controller to the display shall be provided by one (1) 50' Projector control cable.
    - 7) Connection from the MLC Controller to the PVS Switcher shall be provided by one (1) 50' Switcher Control cable
    - 8) At Science Labs provide Desktop Mount at teacher's workstation for Media Link Controller
      - (a) Provide and Install Extron MLM 104 4GWP four gang wall mounting kit for the MLC 104 IP Plus. Part number 70-379-02. Mount to Extron SMB104 surface mounted four gang box, part number 60-642-02.
      - (b) Provide and install Extron PVT RGB AAP for VGA video and stereo audio connection at teacher's workstation, part number 70-722-02
      - (c) Provide and install Extron Two RJ-45 Female to Female Barrels AAP, part number 70-100-11
5. Audio & Speech Reinforcement.
  - a. Speakers - In suspended ceiling applications, install Extron Model FF 120T speakers with two foot cross bars. Quantity as shown on drawings.
    - 1) The input connector uses (1) 5mm captive screw for 1 input.
    - 2) Connection from the PVS switcher to the FF 120T speaker shall be provided by Plenum rated 18 Gauge Speaker Cable Extron SPK-18.
6. Media Source Interfacing
  - a. The media source equipment shall be connected to the audiovisual system via two to four (2-4) (see drawings for exact count) Active (powered) Twisted Pair Transmitter

Wall Plates. These wall plates shall enable the system to display video, graphic data and audio from Laptop computers, DVD and VCRs, document cameras, camcorders, etc.

- b. These active interface transmitters shall be placed in convenient locations throughout the classroom to facilitate easy connection of sources, per the drawings.
- c. Provide one (1) PVT RGB D IP Plus, VGA Video Twisted Pair Transmitter with Dual Network. Wall Plate shall be used to connect RGB devices to the system and transmit the video and audio data to the PVS switcher as well as provide two network connections to the classroom.
  - 1) Active Twisted Pair Transmitter shall transmit RGB video over UTP cable to the PVS Switcher and support video input resolutions of VGA – UXGA RGBHV, RGBS, RBsB and RsGsBs via one (1) female 15-pin HD connector.
  - 2) Wall plate shall fit in a standard, dual-gang electrical box and feature Decora® type faceplates.
  - 3) Stereo audio shall be input via one (1) 3.5 mm mini stereo jack.
  - 4) Data connections shall be two (2) RJ45 jacks.
  - 5) Built-in distribution amplifier output for local monitor shall be provide on one (1) female 15-pin HD connector.
  - 6) The output of the interface shall be via two (2) female RJ-45 connectors.
  - 7) Connection to the PVS Switcher shall be via two (4) UL plenum rated UTP cables.
- d. Provide one (1) PVT RGB D, VGA Video Twisted Pair Transmitter. Wall Plate shall be used to connect RGB devices to the system and transmit the video and audio data to the PVS switcher.
  - 1) The Active Twisted Pair Transmitter shall transmit RGB video over UTP cable to the PVS Switcher and support video input resolutions of VGA - UXGA RGBHV, RGBS, RBsB and RsGsBs via one (1) female 15-pin HD connector.
  - 2) Wall plate shall fit in a standard, single-gang electrical box and feature Decora® type faceplates.
  - 3) Stereo audio shall be input via one (1) 3.5 mm mini stereo jack.
  - 4) The output of the interface shall be via two (2) female RJ-45 connectors.
  - 5) Connection to the PVS Switcher shall be via two (2) UL plenum rated UTP cables.
- e. Provide one (1) PVT CV D, Composite Video Twisted Pair Transmitter. Wall Plates shall be used to connect composite video devices to the system and transmit the video and audio data to the PVS switcher.
  - 1) The Active Twisted Pair Transmitter shall transmit composite video over UTP cable to the PVS Switcher and support video input via a RCA female connector.
  - 2) Wall plate shall fit in a standard, single-gang electrical box and feature Decora® type faceplates.
  - 3) Stereo audio shall be input via two (2) RCA female connectors.
  - 4) The output of the interface shall be via one (1) female RJ-45 connector.
  - 5) Connection to the PVS Switcher shall be via one (1) UL plenum rated UTP cable.

B. Energy Efficiency

- 1. The audio video system shall incorporate energy conservation features to reduce consumption and lower operating costs.
- 2. The system shall incorporate an Auto Power Save Mode with fast power-up that automatically deactivates the audio amplifier after 30 minutes of inactivity. It quickly returns to full power status in less than one second upon signal detection
- 3. The system shall incorporate a Standby Mode that allows the amplifier and twisted pair transmitters to be deactivated when not in use.
- 4. The system shall incorporate monitoring and scheduling of system peripherals, such as sources and displays, in order to deactivate them when not in use or alert to unauthorized use.

C. Extron Priority Pager Sensor Kit

1. The priority page sensor allows the PVS305SA Pole Vault Switcher to mute program audio during announcements from a public address system
- D. Wireless Microphone System
1. VLS 2000H Pendant and Handheld VoiceLift System:
    - a. Each microphone shall have volume control, a power switch and an auxiliary input to use for a MP3 player or other audio source.
- E. VoiceLift Wireless IR Receiver
1. The receiver has a round base with dome shaped translucent cover. This allows for surface mounting on the ceiling and concealed wiring above the ceiling using plenum rated cables run to the dedicated VoiceLift Receiver input of the PVS Switcher.
  2. This device acts as the receiver of up to two room microphones and transmits their audio signal to the PVS Switcher for mix into the program content of presented material. The receiver has a contact closure that when wired and configured to the digital input of the MLC, can trigger instant alert messages to a designated text or email account.
  3. This device installation must not exceed 12' above finished floor per manufacturer's recommendation.
- F. VoiceLift Wireless IR Microphone Charging Station
1. This device is constructed of high impact ABS plastic and acts as a holding and charging station of up to two of the Extron VoiceLift wireless IR microphones. It ships with its own power supply that acts as a recharging station for the two microphones.
- G. TV Tuner Media Box
1. AverMedia Model AVerTV Hybrid TVBox 11.
  2. Media TV Box shall have the following output signal of DVI-I/VGA single link, Audio Output, Composite (RCA), S-Video, Component (YPbPr; 1080i).
  3. Media TV Box shall have input signals DVI-I/VGA Single Link, 75 ohms TV Antenna, Composite (RCA), S-Video, PC Audio, Component (YPbPr; 1080i).
  4. Connect audio and video out from the Aver Media TV Box to an Extron VGA input module and connect to Extron PVS305SA-IP Switcher.
  5. Media TV Box shall support NTSC/ATSC/QAM video signal, 1900 x 1200 (WXUGA) video resolution, 16:9 and 16:10 widescreen format, and Closed Caption.
- H. Projector
1. Casio Lamp Free Signature Model XJ-M255 LED DLP Projector
  2. Brightness: 3000 lumens.
  3. Light Source: Laser and LED Hybrid.
  4. Projector shall have input signals RGB/Component video, mini D-Sub 15 pin, HDMI, Composite Video RCA, S-Video.
  5. Projector shall have Control terminal RS232C and mini D-Sub 9 Pin connector.
  6. Projector shall be 3D and wireless LAN capable.
  7. Warranty shall be 3 years parts and labor plus 3 years or 6,000 hours usage on the light source.
  8. Projector shall support 16:9 and 16:10 widescreen format
  9. Video Signal Compatibility – NTSC/PAL/PAL-N/PAL-M/PAL60/SECAM; DTV/HDTV 480i/480P/576i/576P/720P/1080i/1080p
  10. Power usage – operating power 150w (in Eco mode), 190w (Eco mode off, bright setting)
  11. Projector shall have manual focus and 1.5x manual zoom
  12. Contrast ratio 1800:1
- I. Projector Security Locking Device
1. BMS Model LCD LOC IV Universal Projector Locking Bracket.
  2. The BMS Universal Projector mount bracket shall be able to support projectors up to 25 pounds.
  3. The projector bracket must have independent adjustments of horizontal tilt or roll ( $\pm 15$  degrees of horizontal tilt), vertical angle or pitch ( $\pm 15$  degrees of vertical angle), and rotation or yaw (360 degrees of rotation).

4. The projector bracket shall also use a 1.5" NTP (National Tapered Pipe) threaded pipe adapter for mounting a projector pole.
5. The projector bracket should also maintain positioning adjustments even if the projector is removed for service.
6. The bracket should also feature security flanges that enable the entire unit to be locked to prevent theft.
7. Accessories:
  - a. Security Bar
  - b. Cable Lock System

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that related conditions, including equipment that has been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
- B. All devices connected to equipment specified in this section shall bear the UL label and comply with the applicable National Electrical Code (NEC) standards

### **3.02 INSTALLATION**

- A. All equipment and enclosures described in this specification shall be installed plumb and square per manufacturer's instructions.
- B. All equipment, except that designated as movable, portable or loose equipment, shall be secured and permanently attached to the permanent structure in a manner which will require the use of a tool (e.g.: screw driver, nut driver, etc.) for removal.
- C. All supports shall meet or exceed the load requirements of the intended application with a minimum safety factor of five (5).
- D. Provide support structure and hardware with a SAE Grade 8 load rating (min.).
- E. Classroom AV integrator shall test with installing Active Infrastructure contractor and confirm correct port placement, functionality for the appropriate VLAN and their overall system functionality.
- F. Classroom AV integrator shall coordinate with the Digital Intercom Clock and Bell System contractor for the installation of the priority page sensor with the clock and bell system.
- G. Integrator shall furnish all equipment, labor, system setup, and other services necessary for the proper installation of the products/system as indicated on the drawings and specified herein. System setup information shall include each components proper mounting and alignment and properly verified signal pathways and operation. Proper operational and network support control functions shall be verified.
- H. Install in accordance with manufacturer's handling and installation instructions.
- I. Install in accordance with all local and pertaining codes and regulations
- J. Utilize an Integrator with demonstrated experience in projects of similar size and complexity.
- K. Equipment shall be configured and in ready to use condition at the end of installation.
- L. Energize and commission equipment in accordance with manufacturer's instructions. Commissioning the system shall at minimum, consist of the following:
  1. Install Global Configurator software on PC
    - a. Download from [www.extron.com](http://www.extron.com), or install from Extron Software Products CD.
  2. Make the following MLC cable connections:
    - a. Power
    - b. Local Area Network (LAN)
    - c. Classroom Source Devices
  3. Configure MLC 104 IP Plus Series using Global Configurator
  4. Download device drivers for all source and projection devices
  5. Create a new Global Configurator project file
  6. Add a device and set its IP address



7. Define the location of the new Media Link Controller device
8. Save the new Global Configurator file
9. Configure e-mail server
10. Configure e-mail messages
11. Configure contacts
12. Assign serial device drivers
13. Assign IR drivers
14. Configure the front panel (All buttons are required to have a function assigned: source or control)
15. Configure associated control modules
16. Create a shutdown schedule
17. Create a lamp hour notification
18. Create a disconnect notice
19. Build the Global Configurator file
20. Upload the Global Configurator file
21. Launch Global Viewer
22. Test the MLC's setup for proper control and support of the classroom
23. Installation of the Extron system is covered in full detail at <http://www.extron.com/training/index.aspx>.

### **3.03 CLEANING**

- A. Remove temporary tags, coverings, and construction debris from interior and exterior surfaces of the equipment. Remove construction debris from equipment area and dispose of properly.

### **3.04 CLOSEOUT ACTIVITIES**

- A. Training
  1. The Contractor shall provide a minimum of 20 hours training for the school district personnel on proper operating procedures for the system after completion per campus. This will include a follow up "advanced" training no later than three (3) months after initial training up to four (4) separate site visits.
  2. Initial Training will cover use of Extron Pole Vault System. In addition, Contractor is required in initial training to provide instruction to District personnel on all classroom AV functionality to ensure that the district can power up and down the TV's, projectors, document cameras, play disks from teachers display device, control volume, change channels, switching between all classroom media equipment, and provide training for Extron Global Viewer to administrative staff and District EMS staff.
  3. Initial Training will also cover the use of Extron Voice Lift system. In addition, Contractor is required in initial training to provide instruction to District personnel on all voice amplification system start up, charging and volume control.

**END OF SECTION**